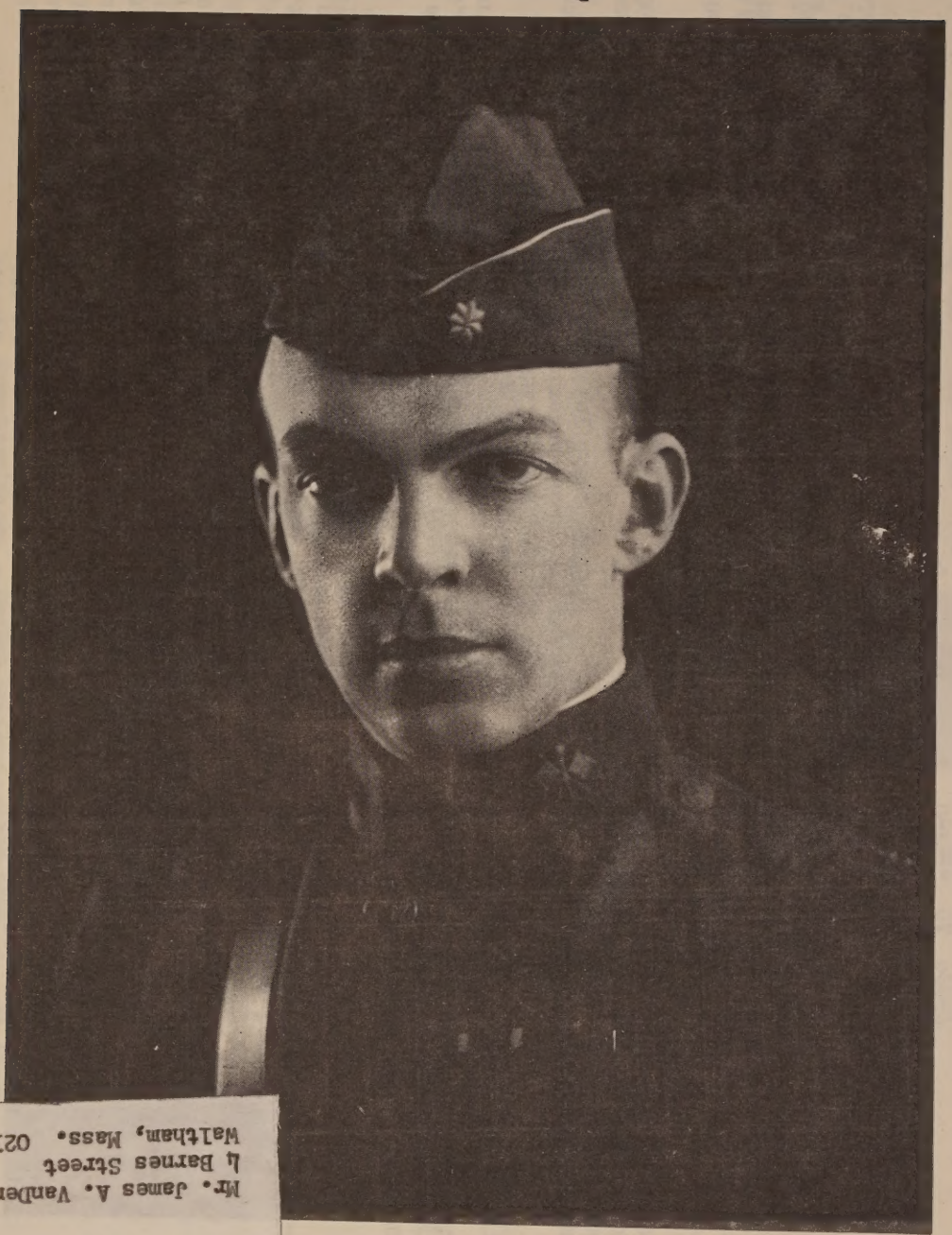
OCTOBER 1974

Single Issue 50¢

THE HORN SPEAKER



EDWIN H. ARMSTRONG

Inventor of the regenerative and super-regenerative circuits

Pioneer of the super-hetrodyne receiver and broadcasting by frequency modulation

Mr. James A. VanDen Avyle
4 Barnes Street
Waltham, Mass. 02154

Vol. III No. 8 OCTOBER 1974 Monthly except during July and August Price $3.00 yearly Single Issue 50¢

Publisher, Jim Cranshaw

Second-class postage paid at Dallas, Texas Office Address: 9820 Silver Meadow Drive, Dallas, Texas 75217

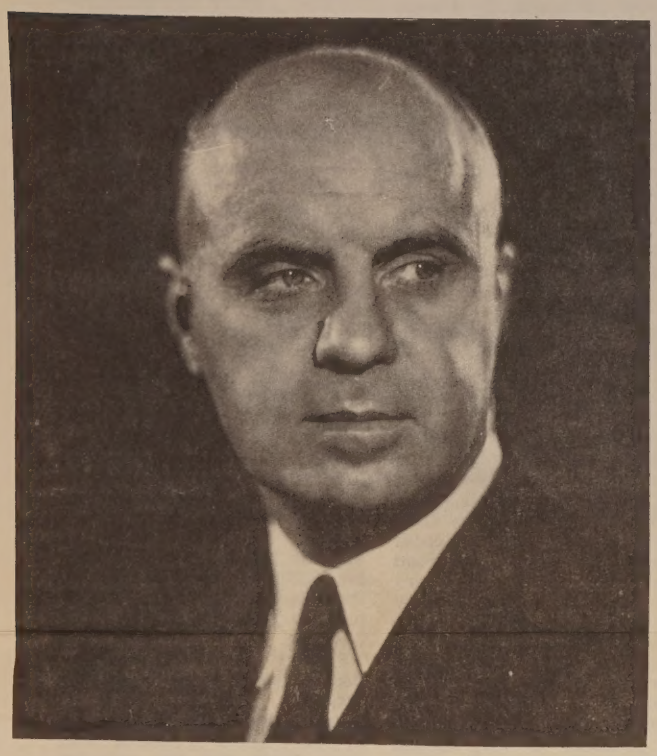
214-286-1673

THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER

The Classic Radio

Earnest Humphrey Scott



The Stradivarius of Radio

by J.W.F. Puett

Like that proverbial old violin at the auction - worthless until the old master picked it up and played - so would be the field of classic radio without the touch of perfection it received from Earnest Humphrey Scott. From 1924 to 1945, E. H. Scott designed and built the world's finest radios (CONSENSUS OF A GROWING NUMBER OF COLLECTORS), many of which, although nearly half a century old, are still treasured by their original owners.

What sort of man was responsible for manufacturing radios which inspire this kind of devotion? - Scott was not a man who enjoyed being second to anyone. He was, by temperament, a perfectionist, an engineer, whose all consuming desire was to be first - to produce radios which were guaranteed to "outperform any other radio or sound reproduction system in either a tone or long distance reception test." This was no idle boast. In the August, 1935, Scott News, he wrote, "During the past ten years, I have repeatedly challenged the whole world of radio to any kind of competitive test, but during this period, not a single manufacturer has been willing to accept this challenge."

E. H. Scott was born in Dunedin, New Zealand, on June 1, 1887. He spent his early years in Australia. His father was killed in a railroad accident when he was only five. When he was fourteen, his mother died suddenly, leaving him an orphan. Confronted with the necessity of self-support, he became a messenger boy, but soon progressed to the position of salesman.

With the advent of World War I, he enlisted in the Australian New Zealand Army Corps and served in France. During this time he invented "a simple little gadget" (the Telecator) for locating troubles in automotive engines. The United States government purchased the rights for his invention which eventually amounted to a total of $46,000.00. Telecators were provided as standard equipment in army machine shops, and were installed on tanks and tractors.

Scott made many American friends while stationed in France. When he was discharged in London at the end of the war, he decided to come to the United States, making Chicago his home.

During his first two years in America, he wrote a column entitled "The Care of an Automobile," which was syndicated in fifty newspapers in the United States and Canada. In this time period, Scott became "intensely interested in radio." In addition to his automotive column, he soon found himself supplying weekly articles on the construction of radio sets. In 1922, he originated the pictorial wiring diagram which "helped thousands of non-technical radio enthusiasts to build their first radio sets."

During the years he wrote radio articles, Scott maintained a well-equipped laboratory where he tested hundreds of different circuits. This was necessary, since he was supplying radio articles to 112 different newspapers.

After four years in America, Scott decided to visit his native New Zealand again. He was determined to take with him a radio capable of receiving U.S. broadcast stations in New Zealand.

Before leaving Chicago, he arranged for stations WGN and WQJ (now WMAQ) to send him special programs when he reached New Zealand. These programs began at 1:00 a.m. and lasted until 4:00 a.m. The distance from Tasman, New Zealand to Chicago is about 8,300 miles. In 1924, very few receivers were capable of tuning in broadcast band signals from that great a distance. Scott tuned in both special broadcasts, logging them for over an hour. The morning after each program was broadcast, he cabled program details to the stations and sent them his logs by registered mail.

During his thirteen week stay in New Zealand, Scott logged 117 programs from 19 different stations, all 6,000 miles or more distant, establishing four world's records for the "consistent night after night reception of stations 6,000 miles or more away." THIS WAS 1924!

To prove that he did not have a "freak set," Scott cabled Chicago for a duplicate set of parts and built a second receiver there in New Zealand. The second set performed as well as the first, and Scott named this receiver the World Record 9. The second set was left in New Zealand when Scott returned to America.

Upon his return to the U.S., Scott checked his logs personally with the managers of Los Angeles stations KHJ, KFI, and KNX. The station manager of KNX could hardly believe that it was possible to pick up his 500-watt station almost every night 6,000 miles away. To prove this kind of reception was possible, a test program was arranged with station KNX. A cable was sent to the man in New Zealand who purchased the second World Record 9, asking him to pick up the program and report it by cable. The following morning, a cable arrived from New Zealand giving program details and several weeks later, the log arrived by mail.

When Scott arrived in Chicago, he received hundreds of requests from radio fans in all parts of the country asking for construction details on the World Record 9. He published and sold hundreds of copies of a booklet which contained all technical data on this set.

Many who constructed this receiver had difficulty aligning the circuits and came to Scott for assistance. In that time, very few laboratories had the necessary equipment to "properly match" I.F. transformers. Mr. Scott was thus "forced to go into the radio business," and began supplying matched sets of I.F. transformers.

He opened his first laboratory, The Scott Transformer Company, in 1924. It consisted of two rooms, each about fifteen feet square, one an office and the other the laboratory. In the September, 1933, Scott News, he wrote, "Right from the start, my only interest and ambition has been to design and build the very finest radio receiver possible."

The growth of the company was rapid in spite of the depression, a tribute to the business genius of Scott. In 1933 he doubled the size of the laboratory. Expansion continued, and by 1935, the company was housed in a large modern three-story building with 97 employees.

Unfounded claims of fantastic sensitivity, selectivity and fidelity made by other manufacturers annoyed Scott. Upon reading an advertisement that a certain receiver "would give reception on the broadcast band of stations up to 5,000 miles in broad daylight," Scott offered to wager $1,000.00 that it could not be done. His wager was refused. When a manufacturer offered "an open challenge to any and all reception records," Scott accepted by registered letter, offering a side-by-side public reception test. The letter was never answered. Scott concluded, "Bluff is all right until someone calls it."

Scott's designs and innovations were often copied by other manufacturers. When another company offered four consoles which were "Chinese copies" of Scott console designs, he retorted by quoting Kipling:

"And they asked me
how I did it,
And I gave 'em the
scripture text;
'You keep your light
so shining
A little ahead of the
next.'
They copied all they
could follow,
But they couldn't
copy my mind,
And I left them
sweating and
stealing,
A year and a half
behind."

Scott guaranteed his receivers for five years, with only the tubes excluded. Holding to his belief that "the fine things are always hand made," he never considered mass production.

Scott radios probably still hold more verified long-distance broadcast-station reception records than the sets produced by all other manufacturers combined. The following records were established in 1924:

(1) Greatest number of broadcast band stations and programs 6,000 miles or more distant:
(a) 19 stations 6,000 to 8,000 miles distant.
(b) 19 programs from stations 8,000 miles or more distant.
(c) 19 programs from stations 7,000 miles or more distant.
(d) 79 programs from stations 6,000 miles or more distant.
(2) Greatest distance over which voice and music had been heard - 8,375 miles.

As an advertising promotion and demonstration of the performance of the new All-Wave De Luxe, Scott offered an all-expenses-paid trip around the world. The contest was limited to Scott All-Wave owners and spanned the first six months of 1932. During the first four months, Scott owners sent in verified reception reports covering 231 different foreign stations and 13,280 foreign-station programs, which were heard from 41 different countries.

In 1932, a Scott All-Wave receiver in the United States established a record for the most consistent foreign-station short-wave reception - every broadcast from station VK2ME in Sidney, Australia for twelve consecutive months - distance 9,500 miles.

E. H. Scott installed an All-Wave De Luxe receiver aboard the S. S. Manganni on which he sailed to New Zealand in February of 1933. He was able to pick up station WBBM in Chicago all the way to the amazement of passengers and crew alike. He furnished music direct from Chicago for the passengers to dance to each night of the voyage. Scott commented, "There seems to be no other way to definitely establish our right to make the claims we do and to overcome what I know are exaggerations by some of the manufacturers who claim to compete with us to the confusion of some of our prospective customers."

"Once more we will have proven beyond fear of contradiction the supremacy of our receiver."

Radio station WBBM read cablegrams received daily from E. H. Scott during his voyage and announced his reception reports.

The chief Radio Operator of the S. S. Manganni issued this statement, "In all my radio experience, I have never heard such reception of broadcast stations on board ship as that accomplished by the Scott receiver."

On this 1933 trip to New Zealand, Scott visited the man who purchased the second World Record 9 receiver from him in 1924. Although this set had been in continuous use on an average of three hours a day, it was still bringing in stations from all parts of the world. It took a great deal of persuasion, but Scott was finally instrumental in trading a new All-Wave De Luxe for the World Record 9, which was later placed on exhibit at the E. H. Scott Radio Laboratories in Chicago.

Scott did not change the appearance of his sets each year as some manufacturers do for sales purposes. New innovations were constantly incorporated into existing receiver designs, but the models remained essentially the same in appearance. Only when significant developments could not be utilized without drastic changes, was a new model introduced.

Continued on page 2

Meeting For Dallas Collectors

A meeting has been scheduled to get together the radio and phonograph collectors of the Dallas area. Everyone is welcome to bring their ideas and anything they want to sell or swap. Of course, all collectors from out of town are welcome.

Walt Jackson, a well known radio collector, will arrange for everyone to meet at Electronic Center, located at 2929 N. Haskell in Dallas. Activities for the meeting should take place about 7:00 p.m., on October 19, 1974. For more information call Walt, 262-7855 evenings or 526-2023 days.

All Clubs about vintage electronics and sound should send news about meetings and other affairs so that we can print the information.

FIND OF THE MONTH

We are trying to encourage our readers to write in our monthly column, "Find of the Month" how they unearthed a rare collectible item that brought joy to them. Alan Diaz, as you remember in the September issue, told about discovering the Crosley Pup in an old junk shop for 50¢.

THE HORN SPEAKER is looking forward to printing how you made your "find."

E.H. SCOTT

Scott not only stayed abreast with the state-of-the-art, he often surged far ahead of his time. A few of the "firsts" attributed to his designs are listed herein:
(1) First to successfully use more than one tuned RF stage.
(2) First all-wave receiver offered to the general public (1928).
(3) First to successfully utilize the screen grid tube.
(4) First 15 - 500 meter superhetrodyne set without plug-in coils.
(5) First to utilize triple-grid "super control" type 57 and type 58 tubes.
(6) First minimum usable sensitivity of .025 uv per meter at 600 KHz and a maximum sensitivity of .006 uv per meter at 1400 KHz.
(7) First to provide 10 KHz selectivity at a field strength of 600 to 1.
(8) First true high fidelity radio capable of reproducing the entire audio range (30 Hz to 15 KHz).
(9) First to provide variable selectivity control of both RF and IF stages.
(10) First accurately calibrated dial - within .1% on the broadcast band and within 3% on all short wave bands.

E. H. Scott was probably the first radio manufacturer to employ modern reliability testing devices. He designed and utilized electric rotators to test moving parts, electro-mechanical shaking tables to test the permanence of all adjustments, and a special refrigeration cabinet to simulate humid conditions encountered in a tropical climate.

At the Century of Progress (1933 Chicago World's Fair), a Scott All-Wave De Luxe in a Napier console was placed in operation in the control room at the top of the elevator of the Observation Tower at the Sky Ride. Each day, eight to twelve thousand people visited the control room. They heard music and news coming from the radio without the slightest trace of electrical interference, yet the set was situated in the center of a mass of motors, dynamos, and control contractors. This unusual demonstration "proved the perfection of shielding in the Scott All-Wave De Luxe."

In 1935, Scott ads heralded the 23-tube Full-Range High-Fidelity Receiver, also known as the All-Wave Imperial. Four of Chicago's largest theaters were slated to use "two well known receivers" to pick up the Joe Louis vs. Max Baer fight. This program material was to be connected from the receivers to the theater $20,000.00 sound systems. It was found that neither of the receivers was capable of bringing a sufficiently clear signal into the theaters. The theater owner asked E. H. Scott if he thought his new 23-tube All-Wave might do the job. Scott replied, "It is not only capable of bringing in the signal, but of delivering the volume required without feeding it into the theater sound systems!" The next morning, an All-Wave Imperial in a Napier console was installed in the Drake Theater. To the owner's amazement, it brought in the desired station without even a crackle from the ambient downtown electrical interference and "filled every corner of the theater with the volume turned only one-third on." With a standing- room-only audience, the volume was turned one half on.

The supremacy of Scott receivers was now legendary, and their eleganced increased as time marched on. There was the $2,500.00 forty-tube Quaranta, a special version of the All-Wave Imperial with a very elaborate audio system, and finally, perhaps the greatest of all classics - the Philharmonic. There were countless custom built installations, some with remote control systems for both tuning and volume. Some affluent customers even had their large yachts equipped with Scott receivers for entertainment purposes.

Famous people in all walks of life owned Scott receivers. In the world of music, many well known concert masters such as Arturo Toscanini, Eugene Goosens and John Barbirolli treasured the quality sound-reproduction that only a Scott could bring. The list goes on and on - Frank Lloyd Wright, Guy Lombardo, Deems Taylor, Walter Winchell and countless other connoiseurs of the very best.

The period from 1935 to the end of World War II represents Scott's grandest years. His long time feud with McMurdo Silver ended in 1938 when Silver succumbed to bankruptcy and Scott purchased the company assets. Scott commented, "I did this rather than let the tradition for custom built radio pass to someone who might tear down the high standards of quality a custom built product represents."

In 1939, radio station WCFL in Chicago broadcast The Scott Music Lover's Program from 10:30 to 11:30 p.m. Monday through Saturday. E. H. Scott loved fine music and even included "T he Scott Record Review" for SCOTT NEWS readers in 1940.

Scott's mind was always full of improved designs. In 1940, he developed an elaborate 26-tube communication's receiver which was produced in very limited quantities. Known as the Scott Special, this set was perhaps the last and greatest of his ingenious designs. The circuitry bore some similarity to the Philharmonic. There were seven short-wave bands (1.7 to 64 MHz) and two other ranges from 140 to 395 KHz and 520 to 1710 KHz. This set utilized two separate tuners on the same chassis, one for the short-wave bands and the other for the broadcast and low frequency bands. The performance of the Scott Special High Fidelity Communications Receiver was not equaled until years after World War II.

E. H. Scott spent many happy hours with his own Scott Special, which his wife "would not allow in the living room." Gladys Scott much preferred the Philharmonic in a Chippendale Grand console for living room listening. Scott maintained a special listening station in his upstairs den where he kept the Scott Special which was connected to an elaborate outside antenna system.

Scott had two other interests. The first was flying. As a passenger, he logged over half a million miles in his later years. His second hobby was photography, especially making movies. He made many movies on travel in foreign countries and also wrote books on that subject.

Like many others who excel in their field, Scott was eccentric, demanding, a strict disciplinarian, and at times even hotheaded.

From the privacy of his rooftop office, he often checked on his salesmen's talks with prospective customers by means of microphones hidden behind pictures in the Chicago sales salon.

He once dozed off while driving his car and crashed into a Chicago bungalow. As a reminder that sleep can be dangerous, he had an artist paint a picture of the wreck which he hung in his office.

On the other hand, Scott was a man of depth and feeling and a generous employer. Perhaps the greatest testimony to his generosity could be obtained from hundreds of Australian and New Zealand service men who trained in Canada during World War II. Scott financed and operated a club for these men in Chicago. They were treated royally, taken to ball games and on sight seeing tours. Scott made pictures of each man and if one was killed or wounded in the war, he wrote a personal letter to their families. If Scott ever received any recognition for this humanitarian endeavor, it is not known, although others who probably did less received special awards. Mr. Scott's reward was the personal satisfaction he received from helping others in need.

At the outset of World War II, German submarines used direction finders to locate ships at sea up to 100 miles away by tuning in on the minute signal from the local oscillator in any superhetrodyne receiver aboard ship. In only 36 days, Scott designed and developed a receiver which produced no detectable radiation beyond 25 feet. The company immediately began to manufacture these low-radiation receivers which were used both for communication and crew entertainment aboard Navy and Merchant Marine vessels. The firm received the Navy E, the Maritime M, and the Treasury T awards for their part in the war effort.

By the end of the second World War, the last Philharmonic had long since been assembled, tested and shipped to some lucky customer, and the great days were waning for E. H. Scott. In 1943, the company was doing a $2,800,000.00 business with the U.S. Navy, but when Mr. Scott totaled the profits, he found with renegotiation and taxes that he had only $90,000.00 left. Discouraged by previous deficits, and dubious about the immediate postwar future of radio, Scott sold his interest in the company for $260,000.00, remaining in the capacity of president and still in charge of all company business.

From 1943 to 1945, the relationship between Scott and other company officials declined sharply. Returning from a trip to New Zealand in June of 1945, Scott found that the company capitalization had increased from 6,000 shares to 251,000 shares on the strength of war time sales. Almost 225,000 shares had already been sold to the public for $703,125.00 . Scott further found that he had been demoted from president to advertising and sales manager. He turned down the job in a 3,500 word letter. Purchasing large ads in two leading Chicago newspapers, he publicly announced his resignation and disclaimed any responsibility for the stock sale. Without Scott's leadership, the company gradually faded away in the 50's.

Retired, E. H. Scott moved to the municipality of Saanich near Victoria in British Columbia, Canada. His home still stands near the top of the southern slope of Mt. Tolmie, a rocky isolated hill. This location provides a beautiful view of the city and surrounding country including the Olympic Mountain Range in the State of Washington about twenty miles across the Strait of Juan de Fuca.

E. H. Scott passed away in 1951, leaving a legacy of quality and perfection which may never be equaled in the world of radio. The instruments he manufactured were truly "THE STRADIVARIUS OF RADIO RECEIVERS" and in spite of his eccentricities, Mr. Scott will be remembered as the old master whose magic touch the old master whose magic touch made them play.

The author extends special thanks to Mr. Jack Rhodes for contributing invaluable information used in this article. Our thanks also to John Caperton, Anthony Ciardi, Brent Dingman, Earl England, Bob Fabris, John Field, Joe Halser, Walt Jackson, Robert Lynd, Russ Mappin, George Sartor, Buford Smith and John Tishopp.

1941 PHANTOM →

All 3 ads 1922

The Air Is Full Of Music

Miraco Vacuum Tube Radio Receiver

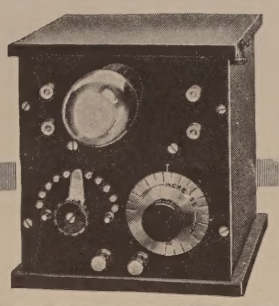
including 22½ volt "B" Battery, 150 feet aerial and insulators

$20.00

Price without these accessories ***$18.00***

THE air is filled with music, lectures and news of the world. You have but to hitch a Miraco Vacuum Tube Radio Receiver to 'phones, batteries and aerial wires and listen in.

No trouble with crystal detector adjustments. The Miraco Vacuum Tube Receiver does away with this. Designed for perfect radiophone reception on wave lengths from 150 to 600 meters. Sensitive to every detail. All you need for a complete outfit are 'phones, vacuum tube and 6-volt storage battery or dry cells.



Dealers:

Write or wire at once for our attractive proposition. You will be proud to handle the Miraco equipment. Sells readily and insures lasting satisfaction.

The Midwest Radio Co.

CINCINNATI, OHIO

The Radio Phonolier

A step forward and upward

THE Radio Phonolier constructively marks a decided advance in Radio reception, and completely transforms the unsightliness of the average Receiving Set to an object of art, thereby elevating it from the oftimes humiliating surroundings of a basement to harmonize with the furnishings of the most particularly appointed room in the home.

Briefly the Radio Phonolier is a 3-step Radio Receiver and Loud Speaker artfully yet artistically inbuilt and moulded in the form of a beautiful table lamp. By means of the scientifically designed ALL WAVE coupler with a ***guaranteed wave length of from 150 to 3000 meters,*** exceedingly fine tuning is possible and a remarkably clear, loud long distance reception is attained. The base of the lamp conceals the loud speaker being beautifully finished in gold, silver, or bronze.

The illumination from two electric light bulbs inside and underneath the shade gives the whole a brilliant setting. All wires, batteries, and other units concealed. No technical knowledge required to operate it.

Priced from $300 up

Complete descriptive circular "B" FREE

If your nearest electrical or phonograph dealer cannot supply you, send us his name and your order—we will supply you direct or through him.

JOBBERS. There is still some territory open—write.

The Capitol Phonolier Corporation

58 Lafayette St. NEW YORK

*De Forest D-7 Reflex Radiophone**

Listen to Half the Continent This Christmas!

HERE'S the latest De Forest triumph, the D-7 Reflex Radiophone* Receiver. It's the newest and most sensitive set of them all, with a thousand mile range on a two-foot indoor aerial! That's what you've been waiting for. No outside aerial is needed. The whole set is as you see it here.

Easy to control with its single knob—small, compact, super-efficient—and an ornament to any library table!

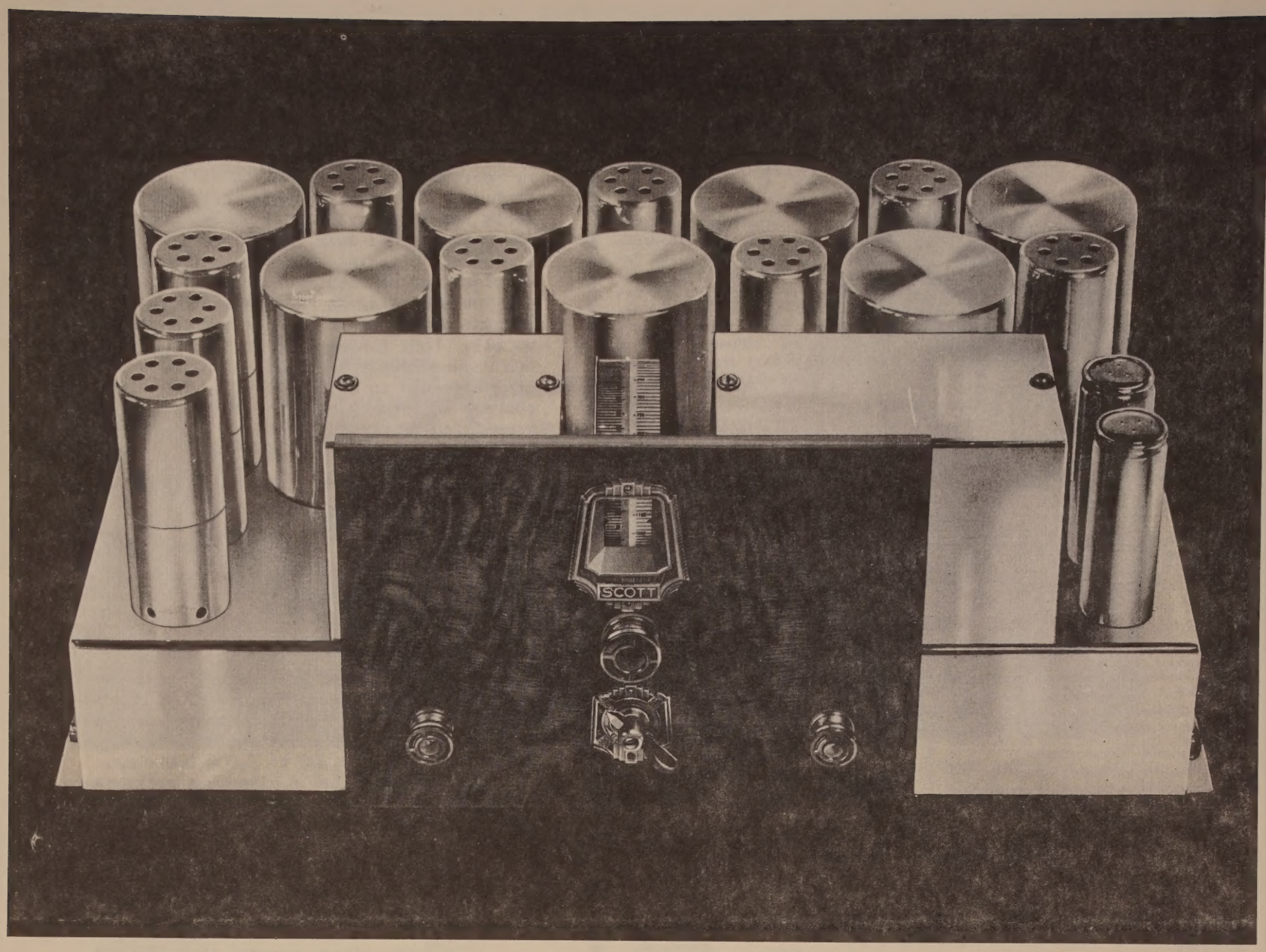
Economical to operate, too, because you get five stages of amplification on three tubes, and correspondingly longer life for your storage batteries.

If you want to bring into your home the news, the music, the lectures of half the American Continent—with no trouble—clearly without interfering noises—this is the set for you. Remember it's a Radio Christmas—and here's one set that is all you ever hoped a receiver could be. Ask your De Forest dealer about D-7 and other De Forest sets—to-day.

De Forest Radio Tel. & Tel. Co.
Jersey City, N. J.

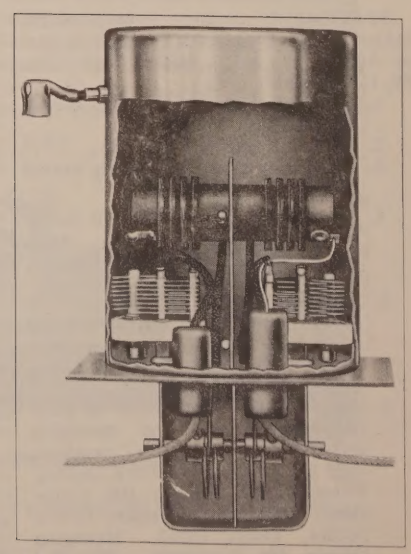
DE FOREST

*Reg. U. S. Pat. Off.



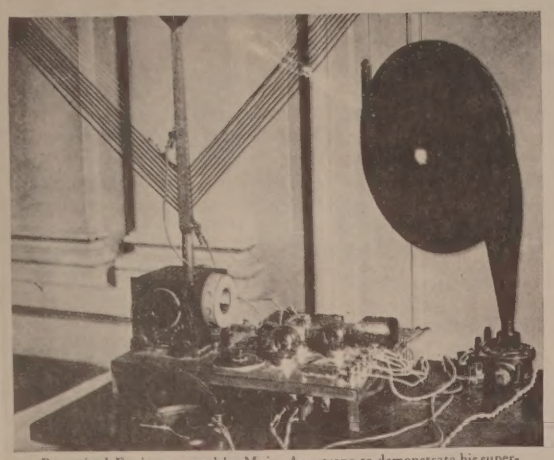
THE SCOTT ALLWAVE DELUXE CHASSIS

MR. SCOTT AT DIALS OF FIRST RECEIVER, THE WORLD'S RECORD SUPER 9, WHICH HE DESIGNED AND BUILT IN 1924



I.F. Transformer Showing Four P1. Litzendrath Coils, Air Tuning Condensers and Part of HI-FI Control.

Armstrong Uses Pacent Radio Essentials in His New Super-Regenerative Circuit



Pacentized Equipment used by Major Armstrong to demonstrate his super-regenerative circuit before the Institute of Radio Engineers

WHEN Major Edwin H. Armstrong recently demonstrated his new super-regenerative receiver before the Institute of Radio Engineers, he was able to receive from the famous WJZ station at Newark (25 miles distant) by the use of three vacuum tubes, although only a small loop aerial was used in the steel framed building of the Engineering Societies, New York City. The program was reproduced with such great volume that it filled the lecture hall and corridors.

In his precision radio work, Major Armstrong chose his equipment with the greatest care and with a keen sense of engineering values. **PACENT** Radio Essentials were selected by Major Armstrong because they were of correct design and constructed with honest materials.

ARMSTRONG CHOSE

Pacent Duo-Lateral Coils, as the best suitable inductances for the auxiliary frequency circuits. Duo-Lateral Coils are the last word in inductances.

Pacent Universal Plug, because of the perfect, constant contact they produce, which is absolutely essential in any radio receivers employing extremely high amplification.

Pacent Multijacks, because, aided by the Pacent Universal Plugs, they allow him to make perfect contacts and to rapidly change connections.

Dubilier Micadons, because they have constant capacity and entirely eliminate the noises caused by paper condensers. Dubilier condensers are essential for steady, continuous operation.

Pacent Radio Jacks, because they were designed especially for radio and they form perfect contact with Pacent Universal Plugs.

Pacent Duo-Lateral Coil Receptacles and Plugs, because of their convenience and the perfect electrical contact they form.

Let Pacent Products help you to build up the efficiency of your radio equipment

Don't Improvise—Pacentize

1922 ad

See the local Pacent Distributor or send for bulletins

PACENT ELECTRIC COMPANY
INCORPORATED
150 Nassau Street NEW YORK
Member Radio Section, Associated Mfrs. Electrical Supplies

Branches:
PHILADELPHIA, PA. Bourse Bldg.
CHICAGO, ILL. 33 So. Clinton St.
WASHINGTON, D.C. Munsey Bldg.

TROUBLESHOOTING THE GRID LEAK

BY
William E. Hemrick

If your radio reception is not up to par, check the grid leak, it has probably increased or decreased in value and you will have trouble such as - the stations fades out, and adjustments has to be made continously, and at times the program dies away, and other times there is a distinct clicking noise with alternate periods of clear and muffled reception. If so chances are you are using an incorrect value grid leak. In some cases the grid condenser cannot function at all. Long distance records in radio reception depend upon the precise adjustment of several elements in the radio set. Too often, the correct adjustment of grid leak resistance is considered of minor importance and frequently it is much too high or too low for the best operation of the detector tube. For every tube and for every circuit there is a certain value of resistance that allows the charge which piles up on the detector grid to leak off at just the proper rate. If this value is too high the charge accumulates, and the tube chokes, if too low, reception is mushy. Unless a leak of the proper resistance is placed across the grid condenser, the tube will either choke or the effect of the condenser will be destroyed.

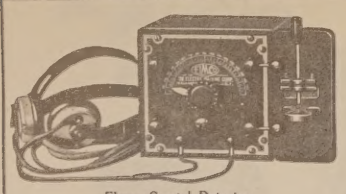
Many radio receivers are unable to operate at their maxiumum efficiency simply because the grid leak is not of the proper resistance value. Grid leaks are used having a resistance from 200,000 to 5,000.000 ohms.

The following table gives the approximate values of grid leak resistance recommended by some vacuum tube manufacturers.

Audion (DeForest) DV-6	.2 Megohms
C-200	.2 Megohms
C-299	.2 to 5 Megohms
C-301-A	.2 Megohms
UV-199	.2 to 5 Megohms
UV-200	.2 Megohms
UV-201-A	.2 Megohms
WD-11 and WD-12	.3 Megohms or more

The volume of the detector tube increases gradually as the proper amount of grid resistance is approached.

William E. Hemrick, Route 1, Box 93 A, Terra Alta, West Virginia 26764.



Elmco Crystal Detector

Elmco Apparatus

Free from body capacity
Do you know what that means?

Users of the Elmco set illustrated here report that they have consistently heard telephone conversations and music from distances greater than 800 miles.

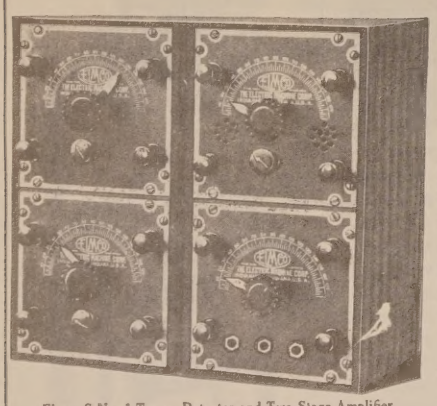
We guarantee every Elmco Tuner Type S-1 to be perfect in material and workmanship and to perform, when used with the Elmco Type A-3 Detector Two-Stage Amplifier, as well if not better than any set of equal price for sale to-day.

Elmco S-1 Tuner and A-3 Detector, Two Stage Amplifier	$100.00
Elmco A-3 Detector, Two Stage Amplifier	60.00
Elmco S-1 Tuner	40.00
Elmco Crystal Detector Set	28.00

We are also able to make quick shipment on all parts such as:

Variable Condensers, .0005	4.00
Vacuum Tube Sockets	1.00
Vernier Rheostats	1.50
Audio Frequency Transformers, mounted	6.00

Write for our Catalogue "R"



Elmco S No: 1 Tuner, Detector and Two-Stage Amplifier

The ELECTRIC MACHINE CORP.
INDIANAPOLIS INDIANA

1922 ad

THE SEARCH

House wreckers in most areas are a good source for "finding" old radios, phonograph, telephones, etc. of ancient vintage. One collector, who had a large collection of early sets had a "contact" with a man, who worked for a contract wrecker. This worker every month or so would present him with a telephone, phonograph or radio that he had found in the house that was being torn down. Sometimes the sets were old and rare sometimes they were only "garden variety". He said, "I usually buy the bitter as well as the sweet,"

1921 ad

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of August 12, 1970: Section 3685, Title 39, United States Code).

1. Title of publication: THE HORN-SPEAKER.
2. Date of filing: Sept. 24, 1974
3. Frequency of issue: Monthly except during July and August.
4. Location of known office of publication(street, city, county, state, zip code): 9820 Silver Meadow Dr., Dallas, Texas 75217.
5. Location of the headquarters or general business offices of the publishers (Not printers): 9820 Silver Meadow Drive, Dallas, Texas 75217.
6. Names and addresses of publishers, editor, and managing editor: Publisher: Jim Cranshaw, 9820 Silver Meadow Drive, Dallas, Texas 75217. Editor: Jim Cranshaw, 9820 Silver Meadow Drive, Dallas, Texas 75217. Managing Editor: Jim Cranshaw, 9820 Silver Meadow Drive, Dallas, Texas 75217.

7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.): Jim Cranshaw 9820 Silver Meadow Drive Dallas, Texas 75217

8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities (if there are none, so state): None.

9. For optional completion by publishers mailing at the regular rates (Section 132.121, Postal Service Manual). 39 U. S. C. 3626 provides in pertinent part: "No person who would have been entitled to mail matter under former section 4359 of this title shall mail such matter at the rates provided under this subsection unless he files annually with the Postal Service a written request for permission to mail matter at such rates." In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the reduced postage rates presently authorized by 39 U. S. C. 3626.

(Signature and title of editor, publisher, business manager, or owner)
Jim Cranshaw

10. For completion by nonprofit organizations authorized to mail at special rates (Section 132.122, Postal Manual)

(Check one)
The purpose, function, and nonprofit status of this organization and the exempt status of Federal income tax purposes
☒ Have not changed during preceding 12 months
☐ Have changed during preceding 12 months
(If changed, publisher must submit explanation of change with this statement.)

11. EXTENT AND NATURE OF CIRCULATION	Average No. Copies Each Issue During Preceding 12 Months	Actual Number of Copies of Single Issue Published Nearest to Filing Date
A. TOTAL NO. COPIES PRINTED (Net Press Run)	900	1000
B. PAID CIRCULATION		
1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES	187	237
2. MAIL SUBSCRIPTIONS	517	624
C. TOTAL PAID CIRCULATION	704	861
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS		
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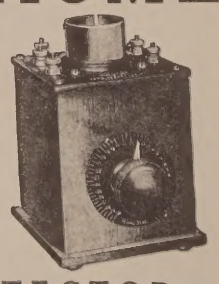
E. TOTAL DISTRIBUTION (Sum of C and D)	714	866
F. OFFICE USE, LEFT-OVER, UNACCOUNTED, SPOILED AFTER PRINTING	186	134
G. TOTAL (Sum of E & F—should equal net press run shown in A)	900	1000

I certify that the statements made by me above are correct and complete.
Jim Cranshaw
(Signature of editor, publisher, business manager, or owner)

ACME



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Transformer and radio engineers and manufacturers

SCIENTIFIC AMERICAN, July 6, 1878

MR. THOMAS A. EDISON.

Many of our readers will recognize in the engraving the face of Mr. Thomas A. Edison, and others, who are not familiar with his appearance, may form a good idea of how the great inventor looks. Every one is acquainted with his telephone, phonograph, and other remarkable inventions, therefore we shall not notice them here.

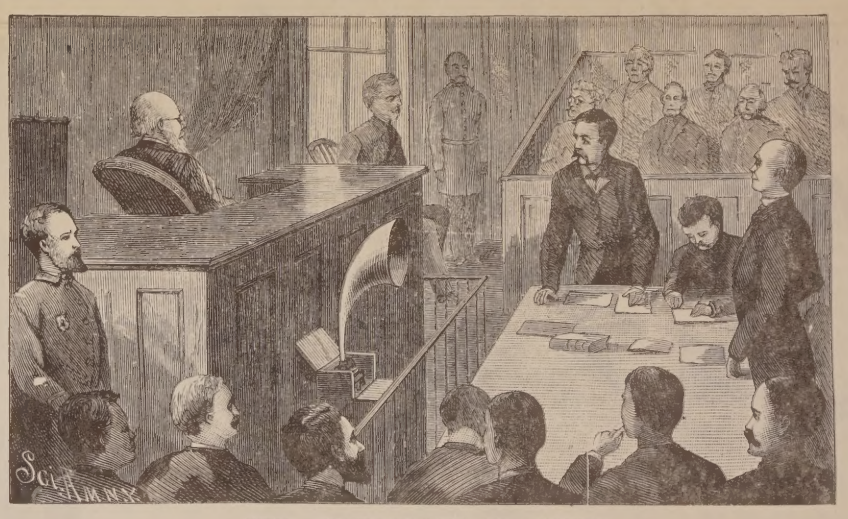
Mr. Edison is above the medium height, and although he is only thirty-one years old, his iron gray hair and thoughtful eye show the effects of continued study. He is genial, liberal, and entirely unostentatious. His mind, day and night, is on his projects; and even while eating his thoughts dwell on his inventions. His table conversation consists of occasional ejaculations regarding some new point in whatever project he may have in hand. He is at home in his laboratory, which is very large and complete in all of its appointments. He has a number of assistants, who are competent and quick to carry out his wishes, and they are often engaged on several widely different subjects at the same time. The experimental apparatus which is completed during the day is often tried at night when all is quiet and no visitors are present.

Notwithstanding his great mental labor, he avers that his health is good, and that as his occupation is pleasurable it does not tire him.

His residence and laboratory at Menlo Park are beautifully situated upon the brow of a hill that overlooks a picturesque valley. The beautiful landscape and the mountain air—Nature's best restoratives for the brain-weary—he has without the seeking.

Mr. Edison may well pride himself as to his position in the world of science, standing, as he does, first among the inventors of the day; and having, by his own energy and persistence, secured an income that enables him to carry forward on a grand scale such experiments as his prolific mind may suggest.

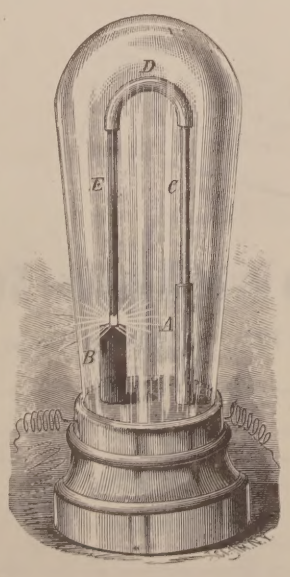
SCIENTIFIC AMERICAN, December 31, 1887



THE PHONOGRAPH IN COURT.

AN ELECTRIC LAMP FOR AN ENGLISH SHILLING.

Blazoned in brilliant colors on a box cover in a show window not a long distance from this office is a representation of a miniature electric lamp, below which are these words, "Real Electric Light. Price 1*s*. This wonderful lamp will produce instantaneously an electric light of great steadiness and power. Its action being automatic, it requires no attention, and will burn for hours, costing a trifle only above gas. It is adjusted readily for immediate use, and is so simple that a child can work it." The box contains a little lamp like that shown in the engraving, and all that is said in regard to it is undoubtedly true, providing the lamp is furnished with a sufficiently strong and constant electric current; but to generate the required current cheaply and conveniently will probably trouble our youthful experimenters, as it has the older heads for a half century. In fact we think a battery capable of running the lamp for any considerable length of time can hardly be made for less than $25.



TOY ELECTRIC LAMP.

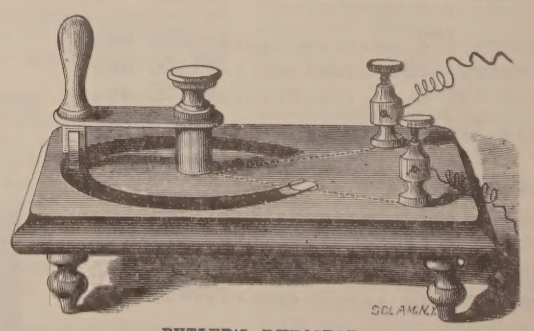
Directions are furnished for making a battery; but a little experience in this direction will soon make plain the unpleasant fact that a strong and steady current cannot easily be maintained by the use of batteries. It will be found that a great deal of electric energy will be required to maintain a single lamp, even a toy lamp. A boy with one of these lamps is in about as good a position, so far as the question of general electric lighting is concerned, as the most experienced in these matters.

The lamp costs 75 cents of our money, and any boy can make it. From the base project a brass tube, A, and a carbon cylinder, B. These are each provided with a wire which projects from the base to be connected with the electrodes of a battery. A wire, C, fits loosely in the brass tube, A, and a curved tube, D, is soldered to its upper end. A slender carbon pencil, E, is inserted in the curved tube, D, and rests upon the carbon cylinder, B. The whole is covered with a glass shade. When the current is allowed to pass through the lamp the light will appear at the juncture of the carbons, E B.

SCIENTIFIC AMERICAN, November 8, 1879

IMPROVED RHEOSTAT.

The rheostat shown in the engraving is the invention of Mr. John Butler, of this city. It is designed for introducing more or less resistance into an electrical circuit. The bed plate is made of non-conducting material, and in an annular groove in its upper surface there is a film or plate of material that offers considerable resistance to the electrical current. Generally the groove is partly filled with plumbago. One end of the resistant is connected with a battery, and the current is completed through a movable key whose pivot is at the center of the circular groove. The key is provided with a roller

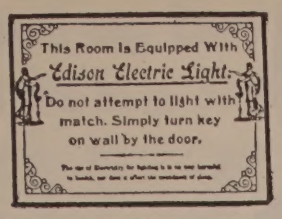


BUTLER'S RHEOSTAT.

which rests upon the plumbago and moves over its surface without abrading it.

This rheostat seems especially adapted to the use of physicians and experimenters.

SCIENTIFIC AMERICAN, September 6, 1879



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as used when electric lights were first installed anywhere. You can MOUNT and DISPLAY the Plaque to any surface because of its ADHESIVE Back. All design and lettering are ENGRAVED and seated in black. A special process added to the GOLD-IN-COLOR aluminum plate makes it impossible to CORRODE or OXIDIZE. Unlimited uses and ideas in the antique field, makes a 5¼x7¼ Eye-Catching Display Humorous but serious. A fine gift for any occasion.

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ANTIQUERS, RADIO/WIRELESS BOOKS

ANTIQUERS, RADIO/WIRELESS BOOKS: All books/catalogs are New REPRINTS, LITROGRAPH unless specified. 1860-66 History, Theory, Practice of Electric Telegraph, Deluxe HB, 500 pages, First book printed with Free 1858 World Telegraph Map, $8.00; Most-Often-Needed Radio Wiring Diagrams by Supreme: Vol. 1 (1926-38) 240 pages, limited supply, $7.00; Vol 3 (1940) over 200 pages, $4.00 Vol's 4, 5, 6, 8, 9, 10 (1941, 42, 46, 48, 49 & 50) over 200 pgs, ea., $4.00; 1927 Radio Encyclopedia HB 175 pgs., $12.95; Softcover $9.95; 1887-1929 Vintage Radio Book, HB, 260 pgs, $6.95; Softcover $4.95; 1921-32 Radio Guide Book; 240 pgs., $3.95; 1920 Young & McCombs Catalog, 46 pgs., $2.00; F. D. Pitts Co. Catalog $1.75; Remler Catalog, 8 pgs., $1.25; (all three $5.00); The following are reprinted by the latest IBM copier Method; 1927 Atwater Kent Service Manual, 40 pgs., $6.00; 1927 Atwater Kent Catalog, 30 pgs., $5.00; 1926 Atwater Kent Radio Instr. Book 3rd ed., 48 pgs., $6.00; Atwater Kent Model 9 Breadboard instr. & oper. instr., 4 pages $2.00; 1928-29 RCA Radiolas catalog, 34 pgs., $5.00; 1931-32 Reinhard Radio Catalog $6.00; 1924 Radiola IIIA Service Manual, 18 pgs., $4.00; Who's Who of Radios/wireless Collecting, MIDCO's New 1974 R/A Antiquer's Directory & Collectors Guide, 46 pgs., $5.00; All books shipped Book rate, otherwise ADD 70¢ Special Handling, $1.50 Air Mail, Insurance extra, Calif. residents 6% sales tax. Order from

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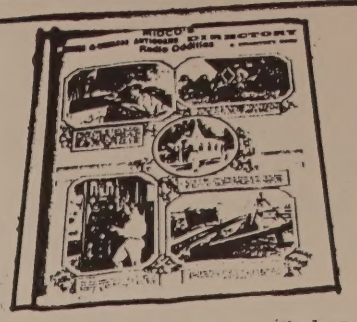
Long Beach, CA. 90815



WHO'S WHO of Radios/Wireless Collecting. No collector or dealer should be without or miss being in MIDCO'S NEW 1973-74 Radio/Wireless Antiquer's Directory & Collectors Guide. NOW AVAILABLE, over 650 names/addresses, call letters, phone numbers of buyers, traders, sellers, museums, clubs, associations, societies, collections, old radio reprints, experimenters projects & hints for the beginner or advanced collector. SERVICES OFFERED: Repairing, appraising, restoring & friendship. ONLY ONE KNOWN, experts keep at their fingertips & in autos when traveling. Order $5 ppd., a little more than a hamburger nowadays. Got an old radio you want appraised? Send all details, Model No., photos. $2 ea. plus return postage.

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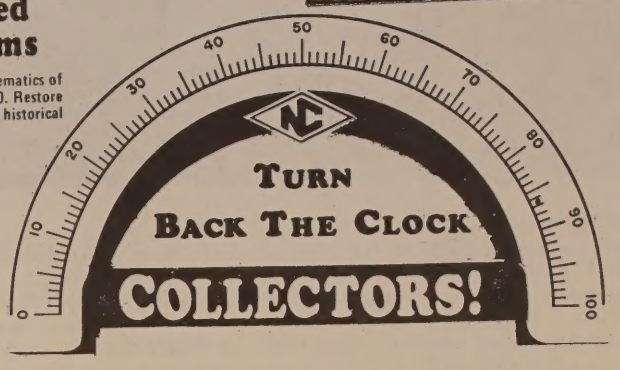

OCTOBER 1974 AD

OCTOBER 1974 AD

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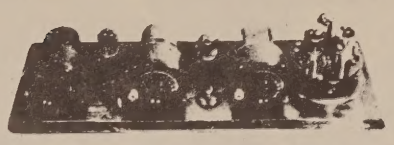
Enthusiastic readers bought out our first edition. Now you can send for the fascinating new edition of this pictorial history of wireless and radio, 1887-1929. It's the collector's bible, with 263 pages and over 1,000 illustrations. Available in handbook or deluxe hard cover.



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Be an instant expert. Lists 9,000 radio models by maker and year introduced, with original price, description and circuit type. A must for every radio buff or antique collector.

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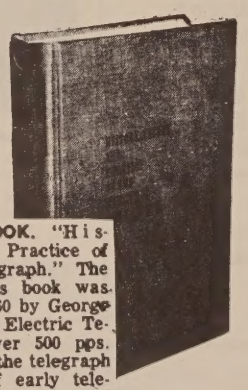

TELEGRAPH BOOK. "History, Theory & Practice of the Electric Telegraph." The orig. copy of this book was first printed in 1660 by George Prescott, Supt. of Electric Telegraph lines. Over 500 pgs. of information on the telegraph & many illus. of early telegraph equipment. Reprints of this book $7.50 ea., ppd.

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From Edison to Stereo

Revised Edition

by Roland Gelatt

Ever since 1877 when Thomas Edison invented a curious tin-foil apparatus to reproduce sound, the phonograph has provided entertainment and the delights of music for millions of listeners.

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Announcing: New limited reprint of S. Gernsback's 1927 RADIO ENCYCLOPEDIA, a priceless record of old-time wireless and radio. Choice of hard-cover or handbook. 175 pages, 1,000 subjects.

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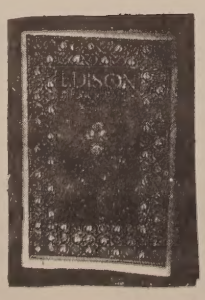

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26-30	1.70	2.90	4.15	15.30
31-35	1.95	3.40	4.80	17.80
36-40	2.25	3.90	5.50	20.35
41-45	2.50	4.40	6.15	22.95
46-50	2.75	4.80	6.85	25.45
51-55	3.05	5.30	7.55	28.00
56-60	3.30	5.80	8.25	30.55
61-65	3.65	6.30	8.95	33.05
66-70	3.90	6.75	9.65	35.60
71-75	4.15	7.25	10.30	38.20
76-80	4.45	7.75	11.00	40.75
81-85	4.70	8.20	11.70	43.25
86-90	5.00	8.70	12.35	45.80
91-95	5.25	9.20	13.05	48.40
96-100	5.50	9.65	13.75	50.90
101-110 ..	6.05	10.65	15.15	56.00
111-120 ..	6.60	11.55	16.50	61.00
121-130 ..	7.20	12.55	17.85	66.20
131-140 ..	7.75	13.50	19.25	71.25
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5c per word per issue over 150 words

Photo ads $2.00 extra.

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ANTIQUE Televisions from 1930s to 1940s. Hallicraftors, Pilots, RCA, Transvision, Philco, Andera, Crosley, more. Send $1.00 for picture and information. Seidel, 614 Grove Lane, Santa Barbara CA 93105. Pho: 805-687-7967.

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WANT EARLY Radio Magazines pre-1925. Have many duplicates of years 1930 - 1949 of Radio News, Short Wave Craft, Radio Craft, Service, etc., to trade or sell. Nothing over $1.50. Five page list 50¢. Collectorium, 2414 Edison Hwy., Bakersfield CA 93307.

WANTED: 1800's to 1930 copies of Popular Mechanics, Popular Science and other machinics and Science magazines. Talking Machines Library, Box 22248, Indianapolis, Indiana 46222.

WANTED: For Federal Model 61 Audio interstage transformer, Antenna - loop control, main tuning condenser. For Stromberg 635 AC treasure chest, cabinet lid and metal feet. P, Ciancia, 10 Glenwood Ave,. Leonia, N. J. 07605.

WANTED: Books, memorabilia about disc recording and pre-1937 television. Will buy or trade wireless telegraphy books. H. Layer, AV-SFSU, 1600 Holloway, San Francisco CA 94132.

WANTED: Old radio books, catalogs, Gernsback manuals, Early test equipment. Give price in first letter. William Hemrick, Route 1, Terra Alta, West Virginia 26764.

WANTED: Record catalogs and supplements early 1890-1940. Also dealer numerical catalogs, for research. Reply guaranteed. T. Brooks, 1940 80th, Jackson Heights, N. Y. 11370.

WANTED TO BUY: Radiola 20, 7B, Grand, Ware T, Gilfillan GN3, other battery sets. Robert J. Corum, 29 Nelkin Dr., Apt. 286, Wallington, N. J. 07057.

WANTED: Factory made crystal sets of 1920's. L. Carlson, 1053 N. Lincoln St, Orange CA 92667.

WANTED: Tone arm for Gramophone. John V. Smith, 1924 Dolphin Blvd., St. Petersburg FL 33707.

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CLASSIC and ANTIQUE RADIOS and Mechanical Phonographs restored, bought, sold. Reproducers and Magnetic Pickups rebuilt. Send SASE for parts and services available. Twentieth Century Talking Machine Co., 856 Cole St., San Francisco 94117. MO 4-0469.

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1921-1931 schematics and service data where available $2.00. Cecil Bounds, Pine Springs Rte., Carlsbad, N. M. 88220.

FOR SALE: Rubber stamp with your name and address plus AK Radio and speaker $3.00 pp. James Fred, P. O. 42, Rossville IN 46065.

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OFFERING - REPRINTS of articles on Tesla and 4 other pages of information on Tesla for $5.00.
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FOR SALE: Western Electric VT5, new in original Ctn. (sealed-never opened) $7.50 each, plus postage. Also, new VT5, good filament, unboxed, $5.50 ea., plus postage. Please enclose estimated postage with your order - unused money will be returned. Floyd Lyons, 456 Post St., San Francisco CA 94102. Ph: 415 392-6600.

AERIOLA SR. Early wood panel model with metal dial plates, with good brass base WD-11..... $95.
CLAPP-EASTHAM 3 tube regen "RADAK" receiver, no cabinet. Audio trans. replaced. Fine shape..$80.
GREBE 3 tube regen. receiver model CR-9. Audio trans and tube sockets replaced.....$150.
RCA WIRELESS receiver Model IP501, buzzer missing.....$350.
RCA RADIOLA V early 3 tube receiver. Fine condition.....$160.
WESTINGHOUSE 3 tube regen. receiver model RADA. Good shape.....$95.
Hans R. Hermann, P. O. 236, Fisher St., Franklin, Mass. 02038.

RARE ANTIQUE FEDERAL 61, 1923 Radio for sale. Excellent condition with tubes. See page 86 Vintage Radio. Have 2 blue 27 Arcturus, no box. One spray shield G24S Original box. Send SASE for information. Glen Van Etten, P. O. Box 141, Texarkana TX 75501.

FOR SALE: Two sets of Tyne's "SAGA OF THE VACUUM TUBE" (23 issues - Radio News) $49.50 per set, plus postage. Floyd Lyons, Elks Club, 456 Post St., San Francisco CA 94102.

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(1) Make all checks or money orders payable to J.W.F. Puett.
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(3) All orders are shipped parcel post - no C.O.D. INCLUDE 15% FOR POSTAGE & HANDLING. INSURANCE RATES ARE 30¢ for orders under $50.00. TEXAS RESIDENTS ADD 5% STATE SALES TAX. MINIMUM ORDER $3.00.

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IN TABLES 1,4 & 6 THE SYMBOL n INDICATES THAT A TUBE IS AVAILABLE NEW AND THE SYMBOL u INDICATES THAT IT IS AVAILABLE USED.

TABLE 1 - OLDER TYPE-NUMBER TUBES - prices listed for new tubes used tubes are half new price

0	u	$4.	5Z3	nu	$2.	6ZY5	nu	$3.	14C5	n	$3.	55	n	$3.
1A3	n	$3.	5Z4	nu	$2.	7A4	nu	$3.	14C7	n	$3.	56	nu	$3.
1A4	nu	$3.	6A3	n	$3.	7A5	n	$3.	14F7	n	$3.	57	u	$3.
1A5	u	$3.	6A4	nu	$4.	7A6	nu	$3.	14F8	n	$3.	58	u	$3.
1A6	n	$3.	6A5	n	$3.	7A7	nu	$3.	14H7	n	$3.	59	n	$3.
1A7	nu	$2.	6A6	nu	$3.	7A8	nu	$3.	14J7	nu	$3.	70A7	n	$3.
1B4	n	$2.	6A7	nu	$4.	7AF7	nu	$3.	14N7	n	$3.	70L7	nu	$3.
1B5	u	$3.	6A8	nu	$3.	7AG7	nu	$3.	14Q7	nu	$3.	75	nu	$3.
1C5	nu	$3.	6B4	nu	$4.	7AK7	u	$3.	14W7	n	$3.	76	nu	$3.
1C6	n	$3.	6B5	nu	$4.	7B4	nu	$3.	14X7	n	$3.	77	nu	$3.
1C7	u	$4.	6B6	nu	$3.	7B5	nu	$3.	15	u	$5.	78	nu	$3.
1D5	u	$4.	6B7	nu	$4.	7B6	nu	$3.	19	nu	$3.	79	nu	$3.
1D8	nu	$4.	6B8	nu	$3.	7B7	u	$3.	24A	nu	$3.	80	nu	$2.
1E5	u	$3.	6C5	nu	$2.	7B8	nu	$3.	25A6	n	$3.	81	u	$5.
1E7	n	$3.	6C6	nu	$3.	7C5	nu	$3.	25A7	nu	$3.	82	u	$3.
1F4	n	$3.	6C7	n	$3.	7C6	u	$3.	25B6	u	$3.	83	n	$3.
1G4	nu	$3.	6C8	nu	$3.	7C7	nu	$3.	25C6	u	$3.	84	nu	$3.
1G5	u	$3.	6D6	nu	$3.	7E6	u	$3.	25L6	nu	$2.	85	nu	$3.
1G6	u	$2.	6D7	n	$3.	7E7	nu	$3.	25S	u	$3.	89	n	$3.
1H4	u	$3.	6E6	n	$3.	7F7	nu	$3.	25Z5	nu	$2.	117-L7	nu	$4.
1H5	nu	$3.	6E7	u	$3.	7F8	nu	$3.	25Z6	nu	$2.	117-Z6	nu	$3.
1H6	nu	$2.	6F5	nu	$3.	7G7	u	$3.	26	nu	$4.	9002	n	$3.
1LA4	n	$3.	6F6	nu	$3.	7H7	u	$3.	26A6	n	$3.	9003	n	$3.
1LA6	nu	$3.	6F7	nu	$5.	7J7	n	$3.	26A7	nu	$3.	VT52	u	$4.
1LB4	nu	$3.	6F8	nu	$2.	7K7	u	$3.	27	u	$3.	XXB	n	$3.
1LC5	n	$3.	6G6	nu	$3.	7L7	nu	$3.	28D7	nu	$3.	XXFM	u	$3.
1LC6	n	$4.	6H6	nu	$2.	7N7	nu	$3.	30	u	$3.	XXL	nu	$3.
1LD5	nu	$3.	6J5	nu	$3.	7Q7	nu	$3.	31	nu	$3.			
1LE3	n	$4.	6J7	nu	$3.	7R7	n	$3.	32	n	$3.			
1LF3	n	$4.	6J8	u	$3.	7S7	nu	$3.	32L6	u	$2.			
1LG5	n	$3.	6K5	nu	$3.	7V7	nu	$3.	32L7	n	$3.			
1LH4	nu	$3.	6K6	nu	$3.	7X6	n	$3.	33	n	$3.			
1LN5	nu	$3.	6K7	nu	$3.	7X7	u	$3.	34	nu	$3.			
1N5	nu	$3.	6K8	nu	$3.	7Y4	nu	$3.	35	u	$3.			
1P5	nu	$3.	6L5	n	$3.	7Z4	nu	$3.	35Y4	u	$2.			
1Q5	nu	$2.	6L6	nu	$3.	12A7	nu	$3.	35Z3	nu	$2.			
1V	n	$4.	6L7	nu	$3.	12A8	u	$3.	36	u	$3.			
2A3	nu	$5.	6N5	n	$3.	12B7	u	$3.	37	u	$3.			
2A4	nu	$4.	6N6	nu	$3.	12B8	u	$3.	38	nu	$3.			
2A5	u	$3.	6N7	nu	$3.	12C5	nu	$3.	39	nu	$3.			
2A6	nu	$3.	6P5	nu	$3.	12C8	nu	$3.	41	nu	$3.			
2B7	nu	$3.	6Q7	nu	$3.	12F5	n	$3.	42	nu	$3.			
3C6	n	$3.	6R7	nu	$3.	12J5	nu	$3.	43	nu	$3.			
3LF4	n	$3.	6S7	nu	$3.	12J7	nu	$3.	44	nu	$3.			
3Q5	nu	$2.	6S8	n	$3.	12K7	nu	$3.	45	u	$4.			
5R4	u	$2.	6T7	u	$3.	12K8	nu	$3.	46	nu	$4.			
5T4	nu	$2.	6T8	n	$2.	12Q7	nu	$3.	47	nu	$5.			
5U4	nu	$2.	6U6	nu	$3.	12Z3	u	$3.	48	n	$5.			
5V4	nu	$2.	6U7	nu	$4.	14A4	n	$3.	49	n	$4.			
5W4	nu	$2.	6V6	nu	$2.	14A7	u	$3.	50A5	nu	$2.			
5X4	nu	$2.	6V7	nu	$3.	14B5	n	$3.	50C6	n	$2.			
5Y3	nu	$2.	6Y6	nu	$2.	14B6	nu	$3.	50X6	nu	$3.			
5Y4	nu	$2.	6Z4	nu	$2.	14B8	n	$3.	51	u	$3.			

ADDITION:
2B5 n $4.
6Q5 n $3.
10/VT-25 n$4.

WE HAVE A FEW OLD RADIO TECHNICAL BOOKS - send S.A.S.E. for list.

TABLE 2 - OLD STYLE GLASS ENVELOPE TUBES
all are used, thoroughly tested
Tube type numbers are listed under manufacturers names.

Ace:		Cunningham:		Magestic:		Philco:		Radiotron:		Sylvania:	
X-224	$3.	C324	$4.	G27	$3.	24	$3.	UX222	$4.	SY224	$4.
Arcturus:		CX326	$4.	G35S	$3.	26	$4.	UY224	$4.		
(blue glass)		C327	$3.			27	$3.	UY227	$3.	SX280	$2.
No. 27	$5.	CX332	$4.	National		36	$3.	35	$2.	Tung Sol:	
No. 51	$5.	CX345	$4.	Union:		37	$3.	UX245	$4.	24	$3.
Crosley:		56	$3.	NY224	$4.	80	$2.	56	$3.	Wizard:	
56	$3.	CX371	$5.	39	$2.			71A	$5.	226	$4.
Ken Rad		80	$2.	Perryman:							
UX245	$4.	CX380	$3.	FA-224	$4.						
56	$3.										

WD-11 substitute TYPE 864 - $2.00 each

TUNGAR BULBS new .5,2 or 15 amp - $3.00 ea

TABLE 3 - TUBE COLLECTOR SPECIALS

Radiotron:		Cunningham:		Majestic:	
10 used	$5.00	CX350 used	$6.00	A.P.(rectifier) used	$5.00
WX12 used	$7.00	De Forest		Raytheon:	
UX200 new	$9.00	Audion:		B-H (rectifier) used	$5.00
used	$5.00	450 used	$6.00		
UX240 used	$5.00				

WESTINGHOUSE PROJECTION BULB TYPE T20 C13F 500W - new $5.

VISITRON (photo cell)- new $5.

WE212F used $15.00
852 used $15.00

TABLE 4 - MORE RECENT TUBE TYPES - prices listed for new tubes used tubes are half new price

0A2	n	$2.	6AT6	nu	$2.	12A5	nu	$3.	35Z5	nu	$2.	1629	u	$3.
0A3	u	$2.	6AU6	nu	$2.	12A6	nu	$3.	3526	nu	$3.	1633	u	$2.
0B3	u	$2.	6AV6	nu	$2.	12AT6	nu	$2.	4025	u	$3.	1634	u	$2.
0C3	nu	$2.	6BA6	nu	$2.	12AT7	u	$2.	4523	n	$3.	1635	u	$2.
0D3	nu	$2.	6BE6	nu	$2.	12AU6	nu	$2.	4525	nu	$3.	2050	nu	$3.
0Y4	n	$3.	6BJ6	nu	$2.	12AU7	nu	$2.	50B5	nu	$2.	2051	nu	$3.
0Z4	nu	$3.	6C4	nu	$2.	12AV6	nu	$2.	5005	nu	$2.	5686	n	$2.
1L4	n	$4.	6J6	nu	$2.	12BA6	nu	$2.	50L6	nu	$2.	5691	n	$2.
1L6	n	$5.	6S4	n	$2.	12BE6	nu	$2.	50Y6	nu	$3.	CK-		
1R5	nu	$2.	6SA7	nu	$3.	12L6	nu	$3.	50Y7	nu	$3.	5703	u	$2.
1S4	n	$1.	6SB7	nu	$3.	12SA7	nu	$2.	117-Z3	nu	$3.	5749	u	$2.
1S5	nu	$2.	6SC7	nu	$2.	12SC7	n	$3.	117-Z4	u	$3.	5751	nu	$2.
1T4	nu	$2.	6SD7	nu	$3.	12SF5	n	$2.	117-Z7	u	$2.	5814	n	$2.
1T5	nu	$2.	6SF5	n	$2.	12SF7	n	$2.	807	nu	$5.	5879	n	$2.
1U5	nu	$2.	6SF7	n	$2.	12SG7	nu	$3.	879	n	$3.	5992	n	$2.
2C26	u	$3.	6SG7	nu	$3.	12SH7	n	$3.	884	n	$5.	6080	u	$4.
2X2	n	$3.	6SH7	nu	$2.	12SJ7	nu	$3.	930	n	$3.	6842	n	$2.
3A4	nu	$2.	6SJ7	nu	$2.	12SK7	nu	$2.	950	u	$4.	6973	n	$2.
3A5	nu	$2.	6SK7	nu	$2.	12SL7	nu	$3.	955	n	$4.	7193	u	$2.
3A8	n	$3.	6SL7	nu	$2.	12SN7	nu	$2.	958	u	$4.	VR90	nu	$2.
3Q4	nu	$2.	6SN7	nu	$1.	12SQ7	nu	$2.	CK-			VR-		
3S4	nu	$2.	6SQ7	nu	$2.	12SR7	nu	$3.	1005	u	$3.	105	n	$2.
3V4	nu	$2.	6SR7	nu	$2.	12V6	nu	$3.	E1158	u	$3.	VR-		
6AB4	nu	$2.	6SS7	nu	$2.	12W6	n	$2.	1201	u	$3.	150	nu	$2.
6AB7	nu	$2.	6SU7	n	$2.	12X4	n	$2.	1203	u	$3.	ADDITION:		
6AC5	nu	$2.	6SV7	n	$2.	19T8	nu	$3.	1232	u	$3.	1U4	n	$2.
6AG7	nu	$3.	6W6	nu	$2.	35A5	nu	$2.	1273	u	$3.	2E30	n	$3.
6AK5	nu	$2.	6X4	nu	$2.	35C5	nu	$2.	1612	u	$3.	6S17	n	$2.
6AL5	nu	$2.	6X5	nu	$1.	35L6	nu	$2.	1625	u	$4.	35B5	n	$2.
6AL7	n	$2.	6Y5	u	$2.	35W4	u	$2.	1626	u	$3.	6146	n	$3.
6AQ5	nu	$2.	6Y7	u	$2.	35Z4	nu	$2.						

TABLE 5 - BALLAST TUBES - $3.00 each - all are new

JFD Type A,B & C; K36A; K49B; K80C; K92B; KXL9B; L55B; 2B14; 3H7; 4P45; 7H11; 40A1; 100-77; 100-79; 165R; 165R4; 185R4; 250R; 6092A. AMPERITE 3TF7; VICTOREEN 1300-8

TABLE 6 - TV AND MISC. TYPES - tubes in this table are priced at — $2.00 new, $1.00 used * * * * * * * * * * * * * * * * * * *

1AX2	n	3BN6	nu	4BQ7	n	5AZ4	n	5T8	nu	6AM8	u	6AX4	nu	
1B3	nu	3BU8	nu	4BZ6	u	5B8	n	5U8	u	6AN8	nu	6AX5	n	
1D21	n	3BY6	n	4BZ7	u	5BQ7	n	5V6	u	6AQ7	nu	6BA7	n	
1X2	nu	3BZ6	nu	4CB6	nu	5BR8	n	5X8	n	6AR5	n	6BC5	nu	
2BN4	nu	3CB6	nu	4CS6	n	5CG8	nu	6AC5	nu	6AR6	u	6BC7	u	
2CY5	u	3CS6	nu	4DK6	u	5CL8	nu	6AC7	nu	6AS5	nu	6BD6	n	
2GK5	u	3DK6	u	4DT6	n	5CM8	n	6AD6	n	6AS7	u	6BF5	n	
2W3	nu	3DT6	nu	4EJ7	u	5CQ8	n	6AD7	n	6AS8	n	6BF6	n	
3AL5	u	3D24	u	4HT6	u	5DH8	u	6AE6	n	6AT8	nu	6BG6	u	
3AU6	nu	3ER5	n	4JC6	u	5FG7	u	6AF6	nu	6AU4	u	6BH6	n	
3AV6	n	3GK5	n	5AM8	u	5GK7	u	6AH4	n	6AU5	nu	6BH8	u	
3B2	u	4AU6	u	5AN8	nu	5J6	n	6AH6	n	6AU8	nu	6BK5	nu	
3BA6	u	4AV6	u	5AQ5	nu	5KE8	n	6AJ5	n	6AV5	u	6BK7	nu	
3BC5	u	4BN6	u	5AT8	nu	5LJ8	u	6AK6	n	6AW8	nu	6BL7	u	

6BN4	nu	6CG7	nu	6CU8	nu	6EM8	n	10DE7	n	12BH7	nu	17DQ6	nu	
6BN6	nu	6CG8	n	6CX8	u	6ES8	u	10JT8	n	12BK5	n	19AU4	n	
6BQ5	u	6CK4	u	6CY5	u	6EZ5	n	12AD6	n	12BQ6	u	19BG6	n	
6BQ6	nu	6CL6	n	6CY7	u	6GK6	n	12AF3	n	12BY7	nu	25AC5	n	
6BQ7	nu	6CL8	u	6GZ5	u	6JZ8	n	12AH7	nu	12BZ7	n	25AV5	n	
6BW8	n	6CM6	n	6DA4	u	6ME10	u	12AJ6	u	12CA5	nu	25AX4	nu	
6BX7	u	6CM7	nu	6DB5	u	6U8	nu	12AL5	u	12DQ6	u	25BK5	n	
6BY5	nu	6CM8	n	6DE6	u	6V3	n	12AV7	nu	12DT5	u	25BQ6	nu	
6BY6	u	6CN7	u	6DN7	n	6V4	n	12AX4	nu	12EG6	u	25CD6	n	
6BY8	u	6CQ8	n	6DQ6	n	6W4	nu	12AX7	nu	12EK6	n	25DN6	n	
6BZ7	n	6CR6	n	6DT6	u	7AU7	nu	12AZ7	u	12FX5	n	25W4	n	
6CB5	u	6CS6	nu	6DX6	n	8AW8	nu	12BA7	n	13DE7	u	35EH5	u	
6CB6	nu	6CS7	u	6EA7	n	9AU7	n	12BD6	n	13DR7	u	50EH5	u	
6CD6	n	6CU6	n	6EA8	u	9BR7	u	12BF6	n	17AX4	nu			

ADDITION- 6BD5 n 6CW4 n 12BK6 n

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